

Self-directed learning system



MicroSim



Laerdal
helping save lives



The story of Laerdal's logo

While the Laerdal company was established in 1940, it was in 1960, with the introduction of the Resusci Anne manikin, that the company dedicated itself to advancing the cause of resuscitation and emergency care. Our founder, Åsmund S. Lærdal, chose the image of the Good Samaritan. It depicts the ancient tale of the traveller whose selfless compassion and care saved the life of a stranger. This is our emblem and inspiration.

Today Laerdal Medical is dedicated to helping save lives with solutions that support the Chain of Survival and the Circle of Learning. The Good Samaritan logo symbolizes our commitment to every health professional and volunteer.



A photograph showing the right shoulder and upper arm of a person wearing a light blue, short-sleeved button-down shirt. The background is a soft, out-of-focus grey-blue color. The text "Being challenged to improve educational efficiency..." is overlaid in white, sans-serif font in the center of the image.

Being challenged to improve educational efficiency...

Increase quality time with students...



The traditional approach

Traditionally, learning has been centered around the teacher. The teacher has been educated in the knowledge needed for passing on knowledge and skills. For practical reasons, the teacher would often need to teach the same knowledge to all learners in a group during a class or lecture type setting.

While some of the learning objectives would match the individual learner's needs, part of the group may also be exposed to learning objectives, which are not relevant to them. For some learners, this might appear inefficient, as the time could be spent on other useful activities. From the perspective of the institution, the teacher-centered approach is the most efficient way to employ its limited resources. Now, with the help of new technology, other choices are available that fulfill both needs.



Focusing our learners

Shifting some of the responsibility for the educational experience from the teacher to the learner is what is often known as self-directed learning. When exercised correctly, the learner's learning objectives will more appropriately match those of the program.

The learner is the primary decision-maker in his or her own learning process. The teacher's role develops into that of a learning facilitator or coach. The facilitator spends less time on communicating knowledge and more on helping the learner to navigate the journey of acquiring knowledge and competence, so that the teacher increases the quality of time spent with each student.

A man with short, light-colored hair and glasses is shown in profile, looking at a computer monitor. The monitor displays a webpage with text and images. The background is a bright, slightly blurred window.

...by incorporating new approaches to education

What is MicroSim?

MicroSim is a self-directed computer program that simulates medical emergencies and procedures to help learners develop decision making skills. Microsimulation technology uses medical models to bring reality to the educational experience with automated intelligent debriefing for immediate medical feedback. The program comes in 3 versions: Inhospital, Prehospital and Military.

Motivation

Dr. John M. Keller at Syracuse University identified four major dimensions of motivation: interest, relevance, expectancy and satisfaction. Motivational Design and Management needs to be addressed by an effective educational strategy, and MicroSim is one tool to help educators motivate learners and improve outcomes.

Adding MicroSim to strengthen your education program...

The decision to integrate MicroSim into an education program can be motivated by different reasons, depending on the needs of your organization. Typically, an organization would choose to build MicroSim into a program in order to meet one or more of the following goals:



Educational goals

Improves training effectiveness by...

- Standardizing training methodology
- Simulating scenarios integrated with curriculum
- Quality assurance of educational outcome
- Standardizing outcome measurements
- Documenting performance and improvement
- Improving face-to-face quality time

Improves learner's learning experience by...

- Pre-class use: Arriving better prepared for class
- Post-class use: Reinforcing classroom instruction
- Remediation: Debriefing and scoring that allow for remediation of weaknesses.

Multi-level application for...

- Initial training and certification
- Continuing education and re-certification

Economic and logistical goals

Improves efficiency by...

- Convenient, self-directed learning modality can be used outside of classroom
- Reducing students' time away from the job
- Increasing efficiency of instructor time
- Increasing efficiency of classroom time
- Reducing class time
- Reducing regional infrastructure costs, e.g. less need for travel

Increases revenue

- Advanced learning technology attracts new students
- Opportunities to expand training programs, e.g. add or expand home/distance learning programs and teaching/skills labs.

*Do not compromise the quality of your educational program.
MicroSim provides a vehicle that enables you to meet educational goals within economic constraints.*

...by satisfying both educational and economic goals

What are your goals?

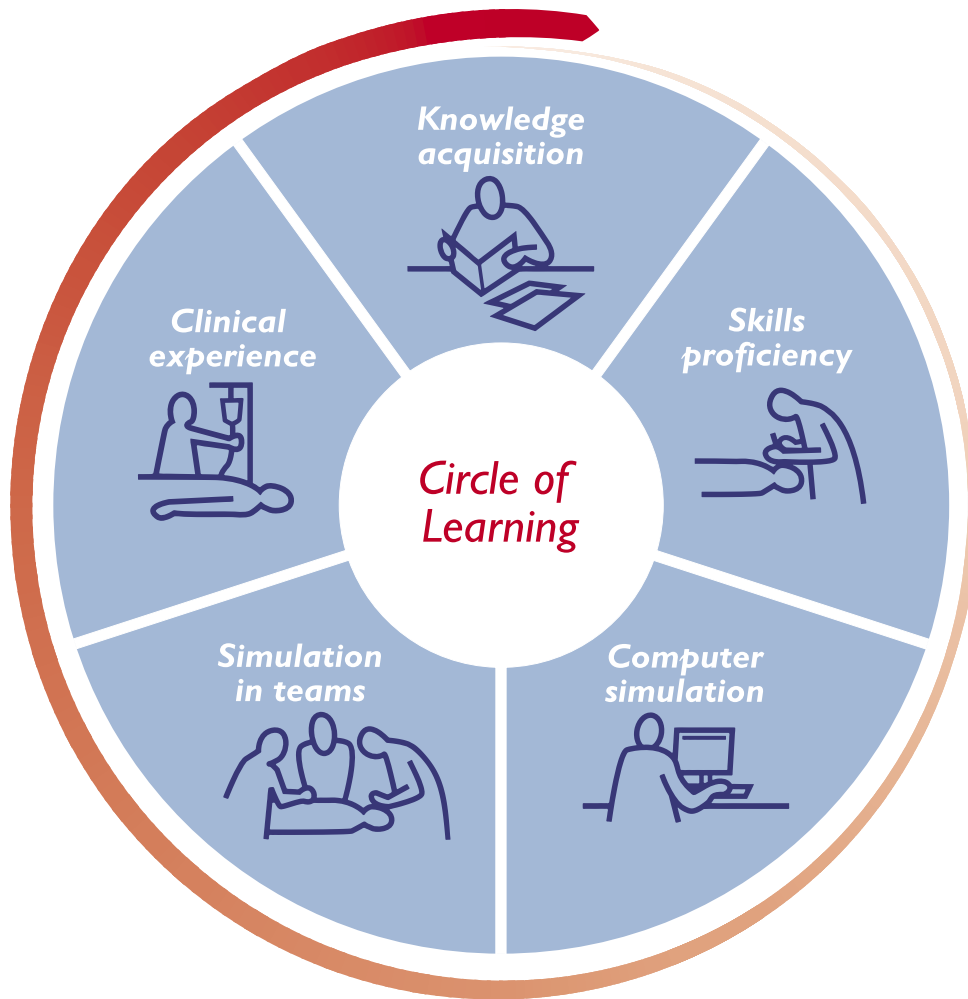
Microsimulation technology gives you the opportunity to solve challenges and meet your goals through an innovative technology approach to learning.



Circle of Learning

Patient safety and outcome are critically dependent on the competence of healthcare personnel. Building real competence is a step-by-step process. It includes acquiring new knowledge and skills, getting used to making quick and safe decisions, training realistically in teams and gaining clinical experience. Maintaining and increasing competence are ongoing processes.

Laerdal has been offering learning products responding to evolving needs in emergency medicine ever since the introduction of Resusci Anne in 1960. Today our range of cost-efficient, life-saving learning products includes graphic source materials, innovative skills trainers, interactive computer simulators and advanced patient simulators. This reflects our belief that helping build competence is a critical part of our mission of helping save lives.



helping build competence

Building competence

As the learner continuously travels around Circle of Learning, often in different patterns, he or she will gradually improve their level of competence rather like moving in an upward spiral. The following gives him or her an illustration of how they might progress.

Novice

At this level, the instructor disassembles the task into problems that the beginner can recognize. The beginner is then provided with relatively simple rules for how to deal with such problems. In other words, the beginner learns simple relationships between specific problems and specific solutions. However, just following the simple rules often does not work. E.g., nitroglycerin is often the right drug if the patient has chest pain, but if the patient is hypotensive, administering this can be dangerous.

Advanced Beginner

As novices start to deal with cases, they begin to develop an understanding of the context in which problems belong. This way, the young doctor may start to use other indicators (e.g. the blood pressure) to judge whether or not nitroglycerin is indicated. However, the decision is still based on specific examples and instructions, usually from more experienced people.

Competence

At this stage, the learner is often able to recognize a broader range of problems. This assists the learner building rules and strategies to prioritize between the major and minor aspects of a problem. As these rules are not clear-cut any longer as in the previous stages, the competent learner will feel responsible for the perspective chosen. This emotional involvement is often considered as being necessary in order to move to higher levels.

Proficiency

The learner reaches the level of proficiency by assimilating experience in a more embodied way. At this level, the user sees what needs to be done rather than having to apply a series of rules to decide how to prioritize tasks. However, the proficient learner is often left with detached rules when making a decision.

Expertise

The expert not only sees what needs to be achieved, but based on previous experience with situational understanding, the expert immediately and intuitively sees how to reach that goal. Aristotle says that the expert "straightaway" does "the appropriate thing, at the appropriate time, in the appropriate way".

"Human understanding was a skill akin to knowing how to find one's way around the world, rather than knowing a lot of facts and rules for relating them. This means KNOWING HOW rather than KNOWING THAT."

Dreyfus and Dreyfus, 'Mind over machine', 1986.

Self-directed learning and computer simulation

It can be argued that the most effective form of self-directed learning is through simulation. Simulation has traditionally been associated with high costs and learners having limited access to simulation.

Laerdal has sought to meet the challenge of enabling learners at all levels to have access to simulation without compromising educational quality standards. Laerdal's computer simulation technology has been developed based on learning principles from educational theory and by working closely with experts in the field. The basis for using this process is outlined below:



Challenge preconceptions

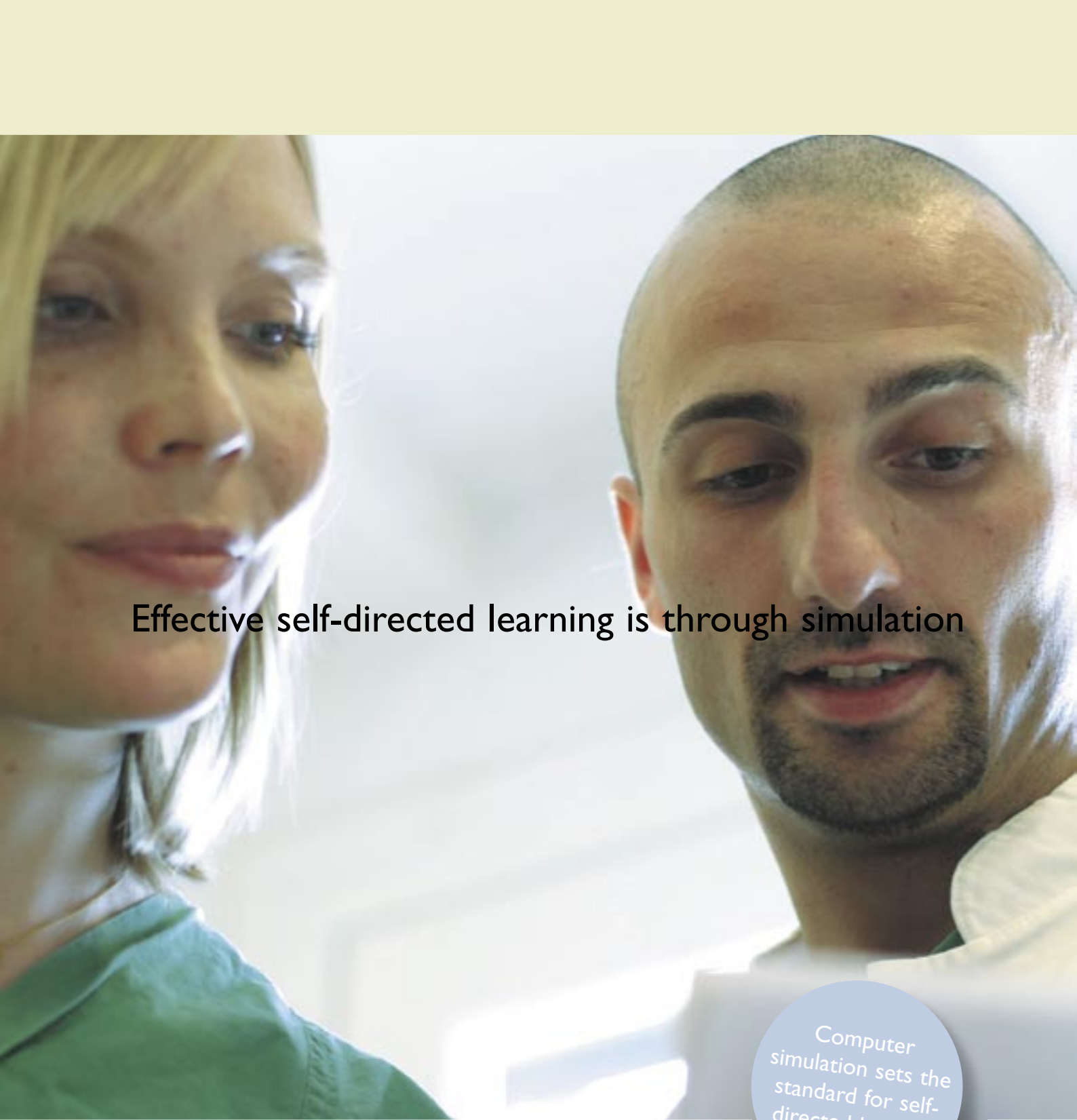
The saying goes that it is "difficult to teach an old dog new tricks." Learners may superficially achieve the learning objectives of a course, but if their preconceptions are not challenged and remodeled during the learning phase, the likelihood is that they will relapse to their old habits.

Knowledge and understanding

As with all professional skills, the healthcare professional needs to know what to do and why to do it. The ability to understand 'why' allows the learner to adapt to atypical situations not directly covered during the education process.

Metacognition

Metacognition simply means that a learner is conscious about how he or she thinks and how he or she learns. When a learner takes an active role in their education, learning efficiency improves. By understanding how they think and learn, they are better equipped to efficiently acquire further knowledge and understanding.



Effective self-directed learning is through simulation

Computer simulation sets the standard for self-directed learning

Computer simulation is developed specifically to build the learner's cognitive skills—knowing what to do and when to do it. This can then be combined with psychomotor skills in team training environments with patient simulators, such as SimMan, to put the decision making skills in context.

MicroSim Inhospital

Case Study I: Central Hospital

Present situation

A hospital complex offers continuing medical education to its 1,200 nurses and 500 doctors on an annual basis. The education is administered by the respective departments, which offer different programs. Some departments have monthly classes and lectures, while other departments offer occasional lectures on medical topics. On average, each healthcare professional receives one day of training every two years – some get more, some get less and some get none at all.

Challenge

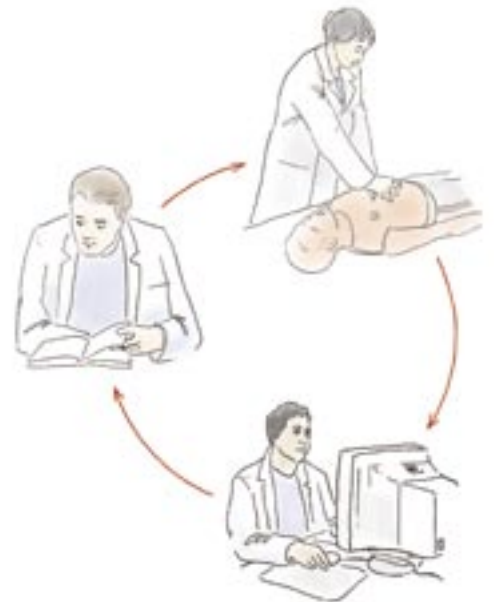
The Ministry of Health has introduced a new regulation that requires healthcare professionals at the hospital to be accredited in advanced and basic life support every year. Existing budget and classroom limitations do not allow for introducing the required 2-day course every year in order to meet the requirements.

Solution

- MicroSim is installed on the hospital network and is accessible to all healthcare professionals
- MicroSim can be accessed either at work or at home
- On an annual basis, the healthcare professional practices 5 patient cases
- Each case requires a 70% pass rate
- Proficiency and skills remediation are demonstrated and practiced on a full-scale simulator with an instructor
- Training records are sent electronically to the medical office in charge of the accreditation process for validation and storage on the hospital personnel records.

Results

- Reduced transportation costs
- Standardized training across all departments
- High quality educational content in training
- Instructors can accredit all healthcare professionals without increased workload
- Ministry of Health regulation is satisfied
- Reduced classroom time for learners



What goals can MicroSim help you accomplish?



The American Heart Association

MicroSim technology is used to deliver HeartCode ACLS, the American Heart Association's ACLS e-learning program.

MicroSim Prehospital

Case study 2: Regional Ambulance Service

Background

An ambulance service has three ambulance stations located in remote locations. There are a total of 80 healthcare professionals at various professional levels. They receive their continuing education from the ambulance service through a third-party education provider at a central location three times per year.

Challenge

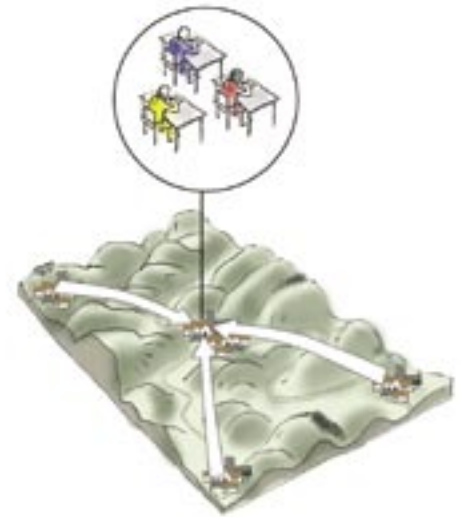
The remote location of the ambulance stations makes it expensive to send staff to central locations for training. The cost of taking the healthcare professionals out of service for not only the training time, but also the travel time, strains the ambulance service. In addition to that, the travel and training costs are forcing management to consider cutting the amount of training. This might, however, reduce the professional competency level of the staff, which would be unacceptable to management.

Solution

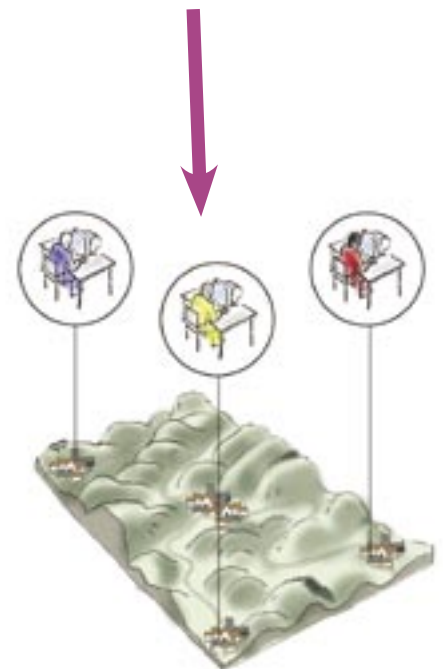
- MicroSim is installed on two computers at each of the three remote locations
- Staff take the MicroSim course at their ambulance station, completing five patient scenarios every month
- The central training is now only conducted once a year
- The training records are sent automatically to the central office every day through CMS for record keeping

Results

- Reduced transportation costs as a result of more distance learning
- Improved efficiency of staff—they spend more time on-site for training
- Reduced external course costs, as part of the training is covered by MicroSim



Existing solution. The continued education is delivered at a central location with educational facilities three times a year.



MicroSim & CMS. MicroSim is installed on one or more computers at each of the three ambulance service stations, and CDs are also distributed to the staff members for use on their home computers. All platforms are automatically connected to CMS.

What goals can MicroSim help you accomplish?

New South Wales ambulance service

Using an early version of MicroSim, 'ResusSim', the Ambulance Education Unit trials found that trainee paramedics with access to a computer-based simulator for resuscitation training outperformed (by an average of more than 10 per cent) trainees who did not have access to the program or to other e-learning support outside of the training room.



MicroSim Military

Case study 3: Medical training school

Present situation

A military medical training school teaches around one thousand medics each year. Students have approximately six hours of lessons a day. Most of the classes involve classroom teaching, where an instructor teaches a number of specific topics. A few times a week, the students have hands-on training with manikins. They learn simple and advanced airway techniques, CPR and teamwork.

Challenge

The school has a shortage of instructors and has difficulties finding more instructors. However, as the demand for medics grows, the school needs to increase the number of students enrolled each year.

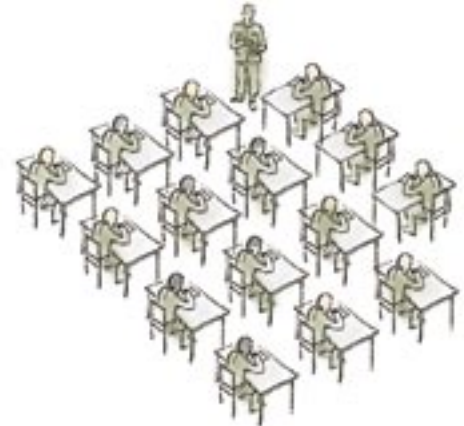
Solution

Lessons are now structured so that a typical day will constitute:

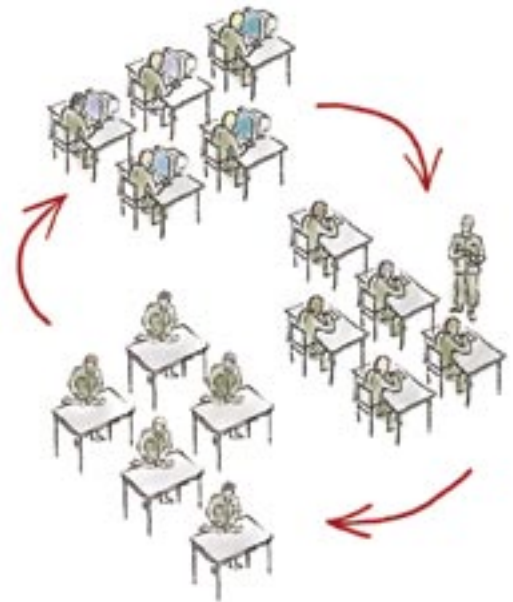
- Two hours of traditional instructor-led classroom teaching of a specific subject
- Two hours of self-directed computer simulation with scenarios addressing specific topics
- Two hours of skills training and patient simulators to practice manual skills and teamwork
- Students rotate around these stations to maximize instructor time

Results

- Instructors spend more time helping students with critical skills
- The school is capable of receiving more students
- The cost per student of the annual training expenditure has been reduced
- Classroom time is spent more efficiently
- Students can undertake their training at times and places that are more convenient for them



Existing solution. The curriculum has a high percentage of classroom teaching, where an instructor teaches a number of specific topics.



MicroSim & CMS. MicroSim is installed in the computer labs on the base, and the students now rotate between classroom teaching, MicroSim scenarios, and skills trainers. All compatible platforms are automatically connected to CMS.

Meeting the needs of primary and sustainment training

The US army chooses MicroSim

MicroSim is now an integrate part of a US army medic's education. MicroSim is used both for primary and sustainment training at both central facilities and remote locations.



Realistic patient scenarios

All the scenarios come with specific learning objectives in emergency medicine. The scenarios are grouped in modules, each containing five patients. For more information about available modules, please contact your local Laerdal representative.

Choose a module on the left. Each module represents a different medical area.

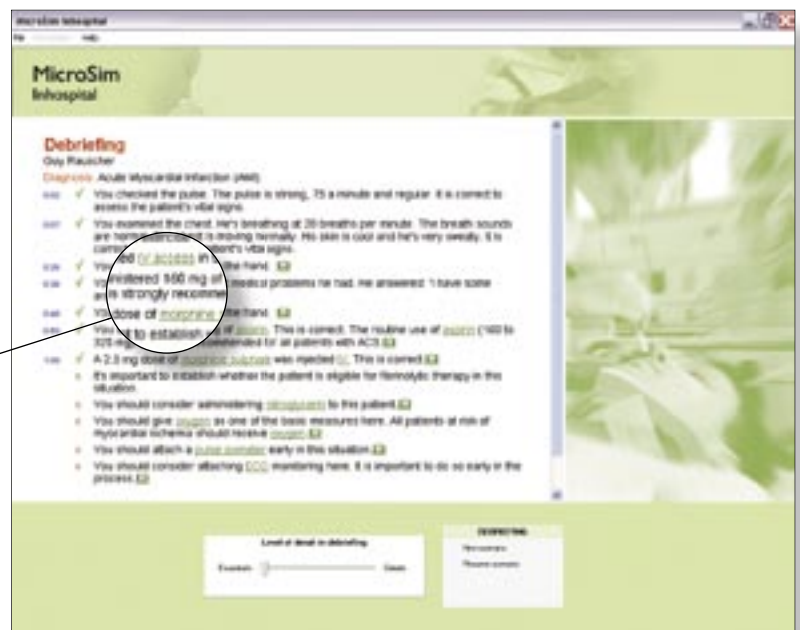
Choose patients within a module either through the patient introduction or directly from the case list.



Automated intelligent debriefing

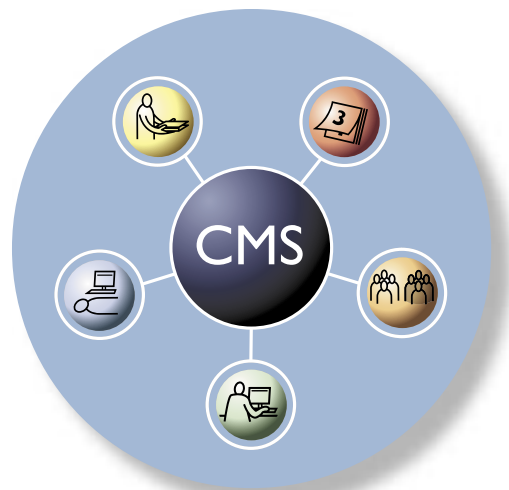
Debriefing after a simulation session facilitates the learner's monitoring of the learning process and engages the learner in developing decision-making skills. Through this, the learner can better understand what happened and how to improve future performance.

Each of the learner's actions during simulation is documented. Feedback is given immediately following a scenario.



Competence Management System

MicroSim works with the Laerdal Competence Management System (CMS), which is a software tool designed specifically for learners and educators. It enhances and helps the educational process needed to build professional competence. The system provides a central administrative link to different modes of learning, allowing effective information processing and management of learning records.



Better learning outcomes

By using the CMS, the learner's education is improved and becomes more efficient:

- Increases the learner's awareness of the education process. Learners can access their performance records such as debriefings of previous simulation sessions
- Improves learners' motivation by continuously providing individualized progress updates
- Provides for a flexible and efficient learning management process as learners can access the CMS from multiple locations, such as the home and office

An innovative management tool

The cost of your administrative tasks is reduced and new management tasks become possible:

- Automates and enhances communication between educators and learners
- Creation of instant reports allows you easy access to learners' records

Empowering the educator

You can become a more efficient educator:

- Real-time monitoring and evaluation of trends in learner groups or learning material
- Real-time identification of specific learner problems needing to be addressed
- Allows for real-time improvement of the education program

Systems compatibility and flexibility

CMS is designed to be capable of working with your IT systems now and in the future:

- Open-source software secures your freedom to design future extensions to the system
- You can custom-build software to integrate with your existing systems

helping manage competence

Software requirement for client:

Internet Explorer 5.0 or later

Windows 95, 98 or ME

Windows NT 4.0 (Service pack 4 or later)

Windows 2000

Windows XP

Hardware requirements for client:

Pentium II 233 MHz (450 MHz recommended)

32 MB RAM (128 MB recommended)

300 MB hard disk, 256 color (16 bit recommended)

Display adapter, sound adapter

Mouse or compatible pointing device

CD-ROM drive

Software requirements for CMS server:

Windows 2000 (Service Pack 2 or later)

Windows XP

Internet Explorer 5.5 or later

Hardware requirements for CMS server:

Pentium III 1.6 GHz

512 MB RAM

5 GB hard disk

Network adapter

Mouse or other pointing device

Competence Management System and MicroSim

MicroSim is fully compatible with CMS, allowing learners, educators and administrators to develop, expand and control the overall learning process.





Language versions

MicroSim is produced in 14 different language versions in order to meet rising global demand for improved educational efficiency. Laerdal's global network of medical and educational professionals has provided a unique opportunity for learners across the world to share a revolutionary technology that helps them build competence.

MicroSim is available in:

- | | |
|---------|------------|
| Chinese | Italian |
| Danish | Japanese |
| Dutch | Korean |
| English | Norwegian |
| Finnish | Spanish |
| French | Swedish |
| German | US English |



...and MicroSim is available in fourteen languages

A global commitment

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